Exploration of the Creation and Evolution Controversy as it Relates to Indiana Biology Textbook Adoption, 1981.

An Honors Thesis (ID 499)

by

Scott Brian Saxman

Thesis Director

Dr. Jon R. Hendrix

Dr. Jon R. Hendrix

Ball State University

Muncie, Indiana

May 1981

Mindset

Religion is a solace to many and it is conceivable that some religion, somewhere, is Ultimate Truth. But being religious is often a form of conceit. The faith in which I was brought up assured me that I was better than other people; I was "saved," they were "damned"--we were in a state of grace and the rest were "heathens." Ignorant louts who seldom bathed and planted corn by the Moon claimed to know the final answers of the Universe. That entitled them to look down on outsiders. Our hymns were loaded with arrogance--self-congratulation on how cozy we were with the Almighty and what a high opinion he had of us, what hell everybody else would catch some Judgment Day.

Jubal
Stranger in a Strange Land

But ask now the beasts, and they shall teach thee; and the fowls of the air and they shall tell thee: Or speak to the earth and it shall teach thee: and the fishes of the sea shall declare unto thee.

Job 12:7-8

This thesis is dedicated to my parents who, for 22 years, have had the difficult task of allowing me to think for myself.

Exploration of the Creation and Evolution Controversy as it Relates to Indiana Biology Textbook Adoption, 1981.

Religion and Science

To gain an understanding for the essence of the struggle between the fundamentalist creationists and the scientific evolutionists, one must first have a grasp of the methods of knowing for each of these factions and how they differ from each other in the way that they reach their conclusions. Science and religion each begin their arguments from a different assumption, thereby leading the paths of their "truth" in separate directions. For this reason, neither side really understands the other, for to truly have an understanding of the other side one must adopt a new way of thinking that is totally contrary to the way one has reasoned in the past.

The basis of science is reason. True scientists must carry out their postulations with a totally disinterested outlook on the conclusions that they may reach. When scientists adopt the scientific method, they must be ready to let things be as they may--whether or not they want them to be that way. Scientists must also be ready to accept their conclusions as being incorrect--the scientific method thus implies uncertainty! A true science cannot guarantee its conclusions beyond all shadow of doubt. It is impossible for scientists to claim that they "know," or that they hold "absolute truth." Instead they must be content to be able to say that the conclusion that they have found is the best that can be formulated given the available data. The plight of scientists is that they can never be certain that the conclusions they have reached are finally correct.

Conversely, the basis of understanding for the creationist is revelation--direct assurance from the absolute truth, God. Religion by its very nature is exclusive in that it not only believes but knows that it has been embodied with absolute truth and understanding according to the revelations that it perceives. God's word is not open to testing by errant human minds, but is to be accepted on faith, and any wordly evidences are used to support the preconceived idea. For the fundamentalist, the Bible is based on revelation, and to be open minded about the word of God is to simply deny its divinity. Whereas doubt is the major moving force in the scientific spirit, it is the antithesis of religious dogma. In essence then, the major difference between reason and revelation is that conclusions based on revelation cannot be corrected but conclusions based on reason always can be corrected.[1]

The major issue then to the creationist is not how man came into being but rather whether the Biblical version is divinely inspired. The fundamentalist would just as readily adhere to the concept of evolution if that was what was written in the book of Genesis. The issue is not what the Bible says, but merely that it does say it.

The existence of a God and of a divinely inspired text serving as an <u>a priori</u> with which the fundamentalists begin is a heresy to the scientific method of knowing. True scientists must be willing to completely deny everything that they have believed if evidence is uncovered that disallows their previous conclusions. They must constantly work with the understanding that everything which they now know may be false rather than revealed truth. It is impossible for religion to assume this method! Fundamentalists begin with their foundation of truth and build the evidence to fit this structure. If the evidence does not coinside

with the inspired version, the fundamentalist attributes the difference to human error or a previous misinterpretation of the material. They do not and cannot reevaluate their "revealed" fundamental truth.

Underlying the fundamentalist's absolute belief is perhaps a fear of the consequences of reexamination. Humans as a whole seem to want absolutes and ideas on which they can rely without any skepticism. The panacea of religion is a sure foundation for the justification of morals and guidelines for behavior within a society. John T. Raulston vocalized this fear when he said,

> If I lose faith in Genesis, I'm afraid I'll lose faith in the rest of the Bible; and if I want to commit larceny I'll say I don't believe in the part of the Bible that says 'Thou shall not steal.' Then I'll go out and steal. The same thing applies to murder.[2]

In his logic, Raulston uses a wedge argument. This wedge argument, fear of removing one brick from the foundation of religion, is a fear that the entire fortress will fall--leaving civilization in moral chaos and ruin if one rejects any portion of scripture.

The struggle between the creationists and evolutionists is much more than an honest attempt by both sides to establish the truth concerning the origin of man. It is a struggle of ideologies, and a fight between two philosophies of knowing and believing. It is a battle that is centuries old and will certainly continue for many years to come. As a sizing remark, a dialogue between a fundamentalist and a modernist written by Walter Lippman sums up the stakes for the creationist side. When asked by the modernist why he was unwilling to be open-minded about the question of evolution, the fundamentalist replied,

> Because for me an eternal plan of salvation is at stake. For you there is nothing at stake but a few tentative opinions none of which means anything to your happiness. Your request

> that I should be tolerant and amiable is, therefore, a suggestion that I submit the foundation of my life to the destructive effects of your skepticism, your indifference, and your good nature. You ask me to smile and to commit suicide.[3]

Darwin and the Theory of Evolution

More than one hundred years ago, a man named Charles Darwin expounded the theory of evolution through natural selection and even though modified, it still stands today as the underlying principle of biology. The term evolution implies a change through continuity--a directional hierarchy of changing life forms through change in diversity and adaptation of living organisms.

Evolution as a theory was first proposed in 1809 by a French naturalist named Jean Baptiste de Lamark, whose work concentrated on the concept of the process of change over a period of time. Life appeared to him to be a natural progression from the smallest organism to the most complex, with a separation between the highest form of animal and man. Lamark's theory involved four principles that were to be the mainstay of evolutionary thought prior to Darwin. First, Lamark believed that animals had a built-in drive to achieve perfection, or to adapt to circumstances in the environment. Lamark also believed that spontaneous generation produced new organisms where none had existed before, filling habitational niches in nature.

The error for which Lamark is most remembered is the heritability of characteristics acquired during the lifetime of the individual. For example, a giraffe which was able to stretch its neck a few extra inches in reaching for food would have offspring with a neck that was also slightly longer. Thus, over a period of several generations a species

of short-necked giraffes would evolve into ones with long necks. Although Lamark was incorrect in many of his assumptions, he did recognize the importance of adaptation to the environment as an evolutionary directive.

In 1831, Charles Darwin set out aboard the H.M.S. Beagle on a five-year journey around the world. During his voyage Darwin, a naturalist, became increasingly intrigued by the observation that various forms of life he encountered were very closely related and yet distinctly different. Upon his return to England, he came to the conclusion that each geographic location contained a different species and set forth the concept of the "transmutation" or evolution of species. Darwin presented his ideas in 1858, in a report to the Linnean Society of London concurrently with those of Alfred Russel Wallace, an English naturalist who had developed his concept of natural selection independently of Darwin's.

On November 24, 1859, Darwin published his full theory in a carefully argued volume entitled, On the Origin of Species. In his book, Darwin set forth four main postulates, two of which were consistant with Lamark's theories. The first was that life is not static but is continually evolving. The nature of species is continual change as new forms come into being and old forms become extinct. Darwin proposed that this change is gradual and continual and has been such since life originated—without gaps or sudden changes. The third and most controversial idea was that of a common descent of all living organisms. Darwin put forth the idea that all life is related through a continuous evolutionary line back to the first living organism. In his evolutionary lineage, Darwin included man in the mammalian branch of the evolutionary tree. This was to be Darwin's unforgivable sin and it immediately aroused a storm of

protest.

The fourth postulate was that of natural selection. Darwin discarded the idea of an inbred drive for perfection in species, and instead set forth the idea of selection through a struggle for survival. Influenced by Thomas Malthus' essay stating that the population of a species increased geometrically while the food supply increased arithmetically, Darwin realized that this difference could only result in a struggle for food and, thus, for survival itself. His theory of natural selection stated that the ones who would survive would be those individuals that were best suited to their environmental niche. It would be these "fittest" of individuals that would grow to reproduce and pass their characteristics along to their offspring in a manner that was not understood by Darwin.

Darwin as a young man was a theist but during his lifetime he grew increasingly convinced that there was no deity involved in the origin of life. Darwin realized the antitheistic connotations of his theories and they came as a hard reality to him in his later life. In a personal letter to Sir Joseph Dalton Hooker, Darwin states: "At last gleams of light have come and I am quite convinced (quite contrary to the opinion I started with) that species are not (it is like confessing a murder) immutable."[4] Darwin died in 1882, a self-confessed agnostic after having laid the groundwork that was to radically revolutionize the field of biology.

The Origin of Species caused an immediate furor in England, but in the United States the reaction was blunted by the effects of the impending Civil War. A large segment of the scientific community geared up to defend the new concept against the certain onslaught from the religious com-

munity. The first reply from the theologians was of course opposition, but the attitude they first presented revealed an incapacity to comprehend the social and worldwide theological implications of Darwin's ideas. Louis Agassiz, one of the chief opponants of Darwinism, took the dynamics of evolution all too lightly and asserted that he would "outlive this mania."[5] To the Christian, the entire world shouted the evidence of creation. All one needed to do to convince one's self was to look at nature and see God's wonderous design as a beautiful and harmonious community—not the harsh and brutal relentless struggle for survival that Darwin depicted.

Yet, despite Agassiz's predictions, Darwin's theories grew in popularity in the scientific community. The fundamentalist backed fringe of Christianity drew upon the masses' ignorance of evolution and attempted to joke away its significance. Professor Randolph Foster of Drew Seminary jibed: "Some future pup, Newfoundland or terrier, in the finite ages may write Paradise Lost....Therefore a pig is an incipient mathematician."[6] Another example came from bishop Richard Owen who while engaging in a serious debate on evolution turned to his counterpart and said:

> I should like to ask Professor Huxley, who is sitting by me, and is about to tear me to pieces when I have sat down, as to his belief in being descended from an ape. Is it on his grandfather's or his grandmother's side that the ape ancestry comes in?[7]

To the serious Christian theologian, Darwinism deserved to be treated on more academic terms. Asa Gray of Harvard wrote an understanding review of Darwinism in his theological works. In his essays four prominant points stand out:

1. A deep respect for Darwin's empirical and theoretical contributions to the problem of species, and sharp criticism of dogmatic repudiation of the idea of evolution.

2. A recognition that Darwin's theory lacked an explanation of variations (such as the science of genetics would later supply).

3. An insistence that scientific investigation continue without impediment.

4. A conviction that Darwinian theory did not contradict Christian doctrine; that regardless of Darwin's or Spences's beliefs, God's purpose in the Creation could be understood in evolutionary terms; and that orthodox views of man's sinfulness found corroboration in Darwin.[8]

Nonetheless, it was to be the outspoken evangelists that would be the impetus of political action during the first half of the twentieth century. Due to their outrage, legislation would be passed throughout the United States that would put a gag on the teaching of the evolutionary theory and cause the rift between science and religion to grow to enormous proportions. The boiling cauldron was at a critical level as the stage was being set for the great explosion—the trial of John Thomas Scopes in Tennessee in 1925.

Evolution on Trial: The Scopes Trial

This is the sorrowful story
Told when the twilight fails
And the monkeys walk together
Holding each other's tails.

KIPLING

To the religious community, the end of the First World War brought a downfall in the morals and conduct of the world. Infidelity, immorality, and lawlessness seemed to be running rampant across the country. The religious fundamentalists felt there needed to be a change in attitudes to curb the spread of these basic evils.

Although the fundamentalist movement was felt on a nationwide scale,

its greatest impact was felt in the south. Due to the Civil War, the race problems, and the climate, the south was the poorest and least sophisticated area of the nation. The need for solace during these troubled times was most strongly felt in this area and, to many, a literal interpretation of the Bible provided a spiritual uplifting.

The fundamentalists of that time were so fanatical in their belief that they would stop at nothing to rectify Biblical statements with accepted scientific ideas. A bill was introduced into a southern state legislature to make pi (the relationship of the circumference of a circle to its diameter, approximately 3.14) equal to three because of a Biblical story of a circular tank made for Soloman that was ten cubits across and thirty cubits around. Legislation was also introduced to declare that the earth was flat because several passages in the Bible led one to infer that idea. In Georgia, a man named Hal Kimberly successfully defeated a bill that would have allowed the establishment of public libraries in that state. Kimberly's rationale was:

> These three are enough for anyone. Read the Bible. It teaches you how to act. Read the hymn-book. It contains the finest poetry ever written. Read the almanac. It shows you how to figure out what the weather will be. There isn't another book that is necessary for anyone to read, and therefore I am opposed to all libraries.[9]

One of the most renouned fundamentalist leaders was a lawyer and three-time defeated candidate for President, William Jennings Bryan. Nicknamed, "The Great Commoner," Bryan carried his keen speaking ability into the fundamentalist fray and, in particular, focused on the heresy of the theory of evolution. Like many others, Bryan was concerned with the moral effects that the teaching of evolution would have on children. Bryan believed that a fact could be tested by determining if a belief in

its truth had any bad moral effects on the believer. When Jesus said, "Ye shall know the truth and the truth shall set you free," He was in effect saying to Bryan that if a truth is damaging it cannot be in fact a truth. In a series of speeches, Bryan summed up the fundamentalist viewpoint of science as follows:

> All the ills from which America suffers can be traced back to the teaching of evolution. It would be better to destroy every other book ever written and save just those first three verses of Genesis. Our children shall not be subject to the inroads of these scientists. If the Bible and the microscope do not agree, the microscope is wrong. I will believe the Bible if it makes every laboratory in the land a liar. If the scientists want to test the truth of any theory, they should search the Scriptures, and if the theory and the Bible do not conform, the theory should be rejected. To hell with your science if it is going to damn souls.[10]

The shot that ended the cold war between the creationists and the evolutionists was fired by John Washington Butler on January 28, 1925. Butler, a freshman legislator, composed a bill that "...prohibited the teaching of the Evolution Theory in all the Universities, Normals, and all other public schools of Tennessee..."[11] Most people did not take the new law seriously. It was deemed an unenforcable law passed in the height of an election year to win votes. Yet, it was this law that was to provide the basis for a test case confrontation on May 7, when John Thomas Scopes was arrested for violating the Butler Act.

John Scopes was the high school science teacher in the small town of Dayton, Tennessee. He was a proponant of evolution, but the idea of making him the test case example against the Butler law came from a local businessman, George Rappelyea, who felt that the publicity of a trial would bolster his business and put Dayton on the map. With legal aid from the American Civil Liberties Union in New York, Scopes' defense

was led by Clarence Darrow, a famous lawyer of the time for his defense of two boys accused of killing a man in Chicago, and an avid opponant of the anti-evolutionary movement.

The prosecution side of the case was to be led by Bryan, who relished the opportunity to once again gain the spotlight and champion one of his favorite causes. On Friday, July 10, 1925, the case of Tennessee v. John Thomas Scopes, No. 5232, was ready to begin.

Although the legal ramifications of the case were very simple (i.e., did Scopes violate the Butler act?) there was very little attempt made by either party involved or the judge to confine the case to that narrow area. It became an issue of science versus religion and to the onlookers, right versus wrong. Each side maneuvered and tugged in small and subtle ways to try and maintain an edge over the other throughout the trial. Darrow objected to a sign in the courtroom that said "Read your Bible," and also objected to the prayer that was used to open each session of court. Bryan, knowing that he was surrounded by fellow fundamentalists, played on their sympathies and religious fervor as a means of influencing the jurors. Although the verdict was a forgone conclusion, the trial did provide for some interesting and colorful moments.

The trial was to last, in all, eight days, yet only one half of one day was to be spent on witnesses. Walter White, the superintendent of schools, was questioned on whether he thought that Hunter's Civic Biology (the book from which Scopes had taught) violated the Butler act. The prosecution offered a King James Bible in evidence during White's testimony whereby the defense objected on the grounds that the Butler act did not specify which Bible was to be used as the source for the origin

of man. The observers in the courtroom were immediately shocked at the idea of there being more than one version of the Bible. Yet Judge Raulston ruled that he "knew a Bible when he saw one," and allowed that version to be accepted.

Next, some students of Scopes' were questioned. They said that, "indeed, Mr. Scopes had taught that life began with a single cell." Some witnesses were presented to clarify the Butler law after which the prosecution concluded its case. A few hours of testimony constituted the entire case against Scopes.

The first witness for the defense was a zoologist and onetime president of the American Society of Naturalists, Maynard M. Metcalf, who testified on the specifics of the theory of evolution. When Metcalf stated that life existed six million years earlier, the courtroom burst out in laughter and in disbelief. Even more incredulous was Metcalf's statement that he would classify man as a primate, along with the lemurs, apes, baboons, and monkeys.

The most controversial and emotional point of the procedings was to be when, in a surprise move, Darrow called Bryan to the stand as an expert witness on the Bible. For years, "The Great Commoner" had stood up and bore witness to his faith and had challenged anyone to dispute what he believed. For Bryan then, there was no escape, for to refuse to get on the stand would have been viewed as a sign of weakness and hypocracy by his followers. Bryan had, at last, come face to face with fate.

Since a belief in the Genesis version of creation was derived from a literal interpretation of the Bible, Darrow questioned Bryan in an effort to get him to admit that the Bible could not always be taken literally and was sometimes vague. Bryan spent most of the time evading

issues and giving circular answers to Darrow's questions. A comical interchange occurred during Darrow's questioning about the exact date of the great flood. During this interchange Bryan made a slip that was the beginning of his downfall and of his eventual humiliation.

Bryan: "I never made a calculation."

Darrow: "From the generations of man?"

Bryan: "I would not want to say that."

Darrow: "What do you think?"

Bryan: "I do not think about things I don't think about."

Darrow: "Do you think about things you do think about?"

Bryan: "Well, sometimes."[12]

Having discredited himself with everyone that did not believe in the literal truth of the Bible, Bryan then lost the support of those who did. Darrow asked the question, "Do you think the earth was made in six days?" To which Bryan replied, "Not six days of twenty-four hours." Bryan immediately realized the implications of his statement and began shouting from the stand about the atheism of Darrow and his intent to destroy the world's beliefs. Yet, the damage had been done. The fundamentalist leader had admitted that he did not believe in the absolute literal interpretation of the Bible, and thereby left the question open as to whether Genesis could also not be interpreted in a figurative sense. For the remainder of the trial, Bryan was an exausted and broken man.

The trial ended with a guilty verdict and a one hundred dollar fine was imposed by the judge on Scopes. According to Tennessee law, the jury must set any fine that exceeds fifty dollars and it was on this technicality that the State Supreme Court let Scopes off without having to rule on the constitutionality of the Butler act. Shortly after the trial,

Bryan died--called to be with God as his supporters claimed. Had Darrow been the one to die, it would certainly have been viewed as an act of judgement from the Almighty.

Ironically, Scopes recalled later that he had been sick and absent during the teaching of the section of the text on evolution; thereby he had never, in fact, violated the law. The innocence or guilt of Scopes was of no matter, for the "great monkey trial" still had a significant impact. The immediate effect of the trial was to thrust the issue into the limelight. Since legislators were afraid of being considered ignorant and subsequently ridiculed, anti-evolution legislation was slowed. Yet, as far as the teaching of the evolutionary theory was concerned, the evolutionists won the battle but lost the war. By failing to push the issue further, the scientific community allowed the teaching of evolution in the schools to decline during the years following the Scopes trial.[13] It was not until many years later that the theory of organic evolution would be widely taught in high school classrooms across the country.

Evolution vs. Creation: The Battle Continues

During the immediate years after the Scopes trial, the scientific community made the error of assuming that evolution was now a household word, and was generally accepted by everyone. Since thirty-seven bills were introduced in twenty state legislatures that would have made the teaching of evolution illegal, and since only three became law, the fundamentalists seemed to be losing their momentum. There was still a small segment of public opinion against evolution, and their action led to the dismissal of teachers in some areas. Yet, the dismissals were sporadic and small

in number and seemed insignificant to the pro-evolution supporters.

Scientists became bold in their assertions, and took for granted that everyone was now an evolutionist. Some textbook authors forsook their scientific method to preach on the "factual nature" of the theory of evolution, typified by Trafton, who wrote:

> ...gradually scientists began to accept the theory of evolution till today it is universally accepted by scientists as fact, and we rarely hear any arguments about its truth. The matter about which scientists now disagree is related to the question of how evolution takes place, but the fact of evolution no scientist doubts.[14]

During the 1930's and 1940's, evolution received increased treatment in textbooks, but the treatment became more brief, noncontroversial, and more subject to restraint. Very seldom was human evolution discussed in the textbooks, and natural selection was modified from the brutal struggle for survival to a more peaceful evolutionary directive.[15] Creationist ideas began working their way into the textbooks, as pointed out by Skoog in his thesis.

> Some of the (textbook) material was changed in revisions. Hunter (1941) stated "Later one-celled plants must have come into existence and then one-celled animals, which feed on the green plants and bacteria." In 1949, a similar statement was extended by Hunter and Hunter with the addition of the line "As you see, if you turn to the first chapter of Genesis, this is the order of Creation."[16]

In the 1950's the U.S. scientific community became interested in improving the quality of high school biology textbooks. With financial aid from the U.S. government, several groups almost completely rewrote the textbooks. The scientists working on the texts were apalled by the quality of the material they were replacing. The books were incomplete, errant in the data presented, and did not adhere to the scientific method of reasoning. The result of this work was the series known as the Biological

Sciences Curriculum Study (BSCS) texts, which gave an unprecedented amount of coverage to the theory of evolution. The three texts (green, yellow, and blue) each approached the field of biology from a different prospective, yet, each used evolution as one of the major themes. Because of the quality of the material and the federal government's backing, the textbooks became widely used throughout the country during the 1960's. The BSCS series was to revolutionize the teaching of biology, and had a profound impact on all of the biology texts that were to follow.

The 1960's and 1970's brought about increased activity from the fundamentalist faction attempting to have special creation taught alongside the theory of evolution. Between 1964 and 1978, there were twenty-two legislative measures introduced that would require creationism to be taught alongside evolution.[17] The fundamentalists strived to insure that creation was given an equal amount of wordage and emphasis in all of the textbooks used in U.S. high schools.

The major stumbling block for the creationists came from the courts, due to the direct relationship between creation and religious dogma. In 1967 the Tennessee antievolution law was repealed, and in 1968, the Supreme Court ruled that the Arkansas law prohibiting the teaching of evolution in the public schools was unconstitutional. The court system consistently maintained the separation of church and state ideology, stating that creation is a religion and not a scientific concept. Seeing the creation theory as nonscientific, the courts ruled the teaching of the dogma to be in violation of the First Amendment. Attorney General Youngster of California issued the statement:

> It is not the lack of a "scientific" basis but rather the Establishment Clause of the First Amendment which prevents the imposition upon such public entities of an affirmative duty to present in

> textbooks adopted by them for use in the public schools of a scientific treatment of creation by a Supreme Being to the extent such treatment constituted an attempt to indoctrinate pupils in a belief in the dogma of any religion or of all religions.[18]

Because of the constitutional problems, the lobbyists for the creation point of view began substituting "scientific creationism" for Biblical creationism. By changing creationism from a dogma to a science, the proponants hoped to sidestep the legal barriers that confronted them. Those who supported special creation began to present "evidences" that indicated that the creation concept is the valid historical method of the origin of life. Gaps in the fossil record, inaccuracies in dating methods, and footprints of humans and dinosaurs found in the same geologic layer are all given as evidence that evolution could not have occurred. Creationists began to present their views as scientifically superior, and began criticizing science as a religion in itself—a religion of "secular humanism" whose only purpose was to replace the other religions of the world.

The fundamentalist religions have grown in numbers in the past few years and their followers clamor to have creation included in the biology curriculum. In 1979 and early 1980, bills were introduced in eleven states mandating the teaching of creationism. An example of such a bill is the one introduced into the Iowa Senate in February, 1979.

> Whenever the origin of man (sic) or the origin of the earth is alluded to or taught in the educational program of the public schools of this state, the concept of creation as supported by scientific evidence shall be taught as one theory.[19]

School boards and textbook commissions have been under increasing pressure to include equal treatment for creation in the public classrooms. Organizations have been formed, including the Creation Research Society and the Institute for Creation Research, whose sole purpose is to "bring

about a revival of belief in special creation as the true explanation of the origin of the world."[20]

The Creation Research Society has published two biology textbooks, the first of which, A Search for Order in Complexity, was thrust upon school boards across the country. The following is a statement from that text:

> Creationists believe that when God created the vertebrates, He used a single blueprint for the body plan but varied the plan so that each "kind" would be perfectly equipped to take its place in the wonderful world He created for them.[21]

The battle between the two ideologies continues into the 1980's. In March, 1981, Christian fundamentalists filed, in California, the first major text case against evolution since the Scopes trial. Attempting to limit the evolutionary content in California's biology classrooms, the fundamentalists, via Kasey Segraves, lost in their bid to have creation mandated. Yet, the movement grows stronger. Members of the moral majority are concentrating considerable money and effort in fostering creationist laws across the country. Politicians are also jumping on the bandwagon due mainly to the tremendous fundamentalist growth in the United States. During the 1980 presidential campaign, candidate Reagan was questioned about the evolution-creation issue, and replied that he thought that creation should be included in the classroom as a counter theory to evolution.

There seems to be a prevailing attitude among the scientific community which underestimates the power of the creationist forces. Most feel that reason will win out over revelation and the hubub over creation will die out as people realize the foolishness behind it. As a closing historical remark, I would like to quote Grabiner and Miller.

The evolutionists of the 1920's believed they had won a great

> victory in the Scopes trial. But as far as teaching biology in the high schools was concerned, they had not won; they had lost. Not only did they lose, but they did not even know they had lost. A major reason was that they were unable to understand—sympathetically or otherwise—the strength of the opponents of evolution. It is worth one's while to inquire into what motivates large numbers of people to oppose evolution.[22]

Introduction to Examination of Indiana State High School Biology Textbooks

In the state of Indiana, biology textbooks are adopted on a five-year rotational basis. A Commission on Textbook Adoption of the Indiana State Board of Education accepts bids from publishers, and then chooses the texts that will be allowed for use in the public school classrooms. The local school boards and teachers then review the list and choose the book(s) that they will use. State law requires the superintendent of schools to report the local adoptions list by June 30 of the year in which the adoptions become effective, to allow the public time to examine the texts before the beginning of the school year.

Five biology textbooks comprised the 1976 adoption list, including the text, Biology: A Search for Order in Complexity, San Diego: Zondervan Publishers, 1975. After the book was adopted as the sole text for use in the ninth grade biology classrooms of the West Clark Community Schools system, Tom Marsh, a local parent, filed suit against the Indiana State Textbook Commission. Marsh felt that the high theistic content of the text violated an Indiana State law that forbids the use of a textbook which contains anything of a partisian or sectarian nature. The Indiana Court ruled that the text did, indeed, violate the law and therefore must be removed from the adopted textbooks list. The book was subsequently removed from that list and is not currently in use in any of the public biology classrooms in the state of Indiana.

The 1981 textbook adoption provided seven biology texts for use in first year classes in Indiana. In an effort to determine the quantity and composition of the evolutionary subject matter in these texts, a model has been developed and applied to that purpose. The amount of creationist material is also examined and compared to the 1976 adopted texts, to determine the amount of influence and progress the creationists have had in the state of Indiana over the last five years. After having discussed an historical prospective of the issue, it is now time to concentrate on the present, and how the controversy of creation vs. evolution is presented in the public high school classrooms.

Table I

Indiana State Adopted Textbooks (1976-1981) Reviewed in this Study

1. Moore, J.N. ed., and H.S. Slusher ed. Biology: A Search for Order in Complexity. 2nd ed. Zondervan Publishing house, Grand Rapids, Michigan. 1974.

2. Oram, R.F., P.J. Hammer, and R.C. Smoot. Biology: Living Systems. 2nd ed. Charles E. Merrill Publishing Co., Columbus, Ohio. 1976.

3. Otto, J.H., and W.D. Otto. Modern Biology. 2nd ed. Holt, Rinehart and Winston, Inc., New York. 1973.

4. Weinberg, S.L., and A. Kalish. Biology: An Inquiry into the Nature of Life. 2nd ed. Allyn and Bacon, Inc., Boston. 1974.

5. Welch, C.A., et. al. Biological Science: Molecules to Man. (BSCS blue), 3rd ed. Houghton Mifflin Co., Boston. 1976.

Table II

Indiana State Adopted Textbooks (1981-1986) Reviewed in this Study

6. Creager, J.G., P.G. Jantzen, and J.L. Mariner. Macmillan Biology. Macmillan Publishing Co., Inc., New York. 1981.

7. Hickman, F.M., et. al. Biological Science: An Inquiry into Life. (BSCS yellow) 4th ed. Harcourt-Brace-Jovanovich, New York. 1980.

8. Meyer, D.E., et. al. Biological Science: A Molecular Approach. (BSCS blue), 4th ed. D.C. Heath and Company, Lexington, Mass. 1980.

9. Oram, R., P.J. Hummer, and R.C. Smoot. Biology: Living Systems. 3rd ed. Charles E. Merrill Publishing Co., Columbus, Ohio. 1979.

10. Otto, J.H., A. Towle, and J.V. Bradley. Modern Biology. 5th ed. Holt, Rinehart and Winston, Publishers, New York. 1981.

11. Slesnick, I.L., et. al. Biology. Scott, Foresman and Company, Glenview, Illinois. 1980.

12. Smallwood, W.L., and P. Alexander. Biology. Silver Burdett Company, Morristown, New Jersey. 1981.

Indiana State Biology Textbooks: 1976

The five textbooks that were originally chosen by the Indiana State Textbook Adoption Committee for use during the years 1976-1981, were analyzed for their content of evolution and creation material. Two of the texts adopted in 1976, were also adopted five years later as different editions (see table I, books 2,3). In these books there were no significant differences with respect to the treatment of evolution, nor were there any additions or deletions of any creationist material over the five-year span.

The Weinberg text (table I, book 4) discusses special creation and defines the conflict between the two ideologies in a historical perspective. In Weinberg's text there is mention of the Scopes trial, and a discussion of the creationist's attempts to have their ideas taught in public schools. Also included is a page-long table with a side-by-side comparison of the special creation theory and the theory of evolution. The inclusion of the creationist material appears to be an attempt to mollify the religious community rather than an honest attempt to present both sides of the issue. Evolution is still stressed as the unifying theory of biology, and no attempt is made to discredit it in the text.

The text written by Welch (table I, book 5) contains a bit of irony in that the author presents other theories of origin besides evolution, but creation is not among them. Half a page of the text is spent discussing the idea of life originating from outer space (cosmozoic theory) and migrating to earth, but no mention is made of any type of a special creation.

The Moore text (table I, book 1), published by Zondervan and developed

by members of the Creation Research Society, was originally adopted and then later dropped from the list by court action. It is an anachronism of grand proportions. In this text, no attempt is made to honestly present both sides of the issue. Rather, evolution is discussed only in an attempt to discredit it. Biblical quotations, stories, and dogmas are strewn throughout the reading, and the scientific method is abandoned totally in the chapters on evolution. This researcher feels that it cannot be considered a legitimate scientific presentation.

Indiana State Biology Textbooks: 1981

The seven textbooks that were chosen by the Indiana State Textbook Adoption Committee for use during the years 1981-1986, were analyzed for their content of evolution and creation material. Although all of the texts refer to evolution as a theory, in only three of the books is the term "theory" stressed and explained to the student (table II, books 7, 8, 9). The controversial aspect of the theory of evolution and the existence of other theories of the origin of man are mentioned in the teacher's edition of two of the texts (table II, books 7, 9). In the teacher's edition of text 7, Hickman states:

> For many years the study of human evolution was hampered by few facts and abundant controversy. Yet by the end of the nineteenth century, most biologists were convinced that Homo sapiens, along with all organisms, is the product of a long evolution. (p. T55)

Oram (table II, book 9) is the only author that confronts the religious controversy and conflict between creation and evolution. Yet, he does so only in the teacher's edition of the text. In a few paragraphs, Oram attempts to discount the differences saying:

There is nothing in the theory of evolution that is contrary to

> the religious beliefs of millions of people;...If one takes every statement in the Bible as being literally true, there will indeed be conflict. But one can accept the spirit of the biblical account, recognizing God as the creator of humans, and still regard them as the product of eons of evolutionary development. (p. T74)

There is no attempt by any of the texts to present creation as an alternative theory to evolution. Neither is there any attempt made to encourage the student to read and analyze alternative concepts. Altogether, the creationists seem to have failed in their bid to have special creation presented to the high school students in the biology classrooms of Indiana—at least for the next five years.

Results and Discussion

The average number of pages devoted to evolution in the 1976 state adopted textbooks was 64.2, while the average for the 1981 texts was almost ten pages lower at 54.3. The percentage of the total text material reserved for the theory of evolution has also decreased during the five year period, from 9.4% in 1976 to 7.3% in 1981. While the amount of evolutionary material covered has dropped in the separate textbook adoptions, the number of topics discussed seems to remain fairly constant with the exception of the Smallwood (table II, book 12) text which stands out from the others distinctively in its sparce presentation of evolution.

When examining tables III and IV, one shortcoming of the data must be kept in mind. Although the tables indicate which topics are discussed, it does not in any way reflect the accuracy or thoroughness of the material presented. From the tables it is impossible to distinguish the creationist text (table I, book 1) from any of the others, although it is radically different in its content. The number of evolutionary topics discussed

does not make one text necessarily better than another. It can be interpreted, however, as an indication that such might be the case for the evolutionary portion of the text.

While two of the texts in the 1976 adoption specifically discussed creationism in the text, none of the 1981 books even mentioned the theory in the student version of the book. The creationist's pressure to have their ideas included in high school textbooks is certainly not reflected in the biology books that were chosen for Indiana schools. Using these texts, the student will not be exposed to the creationist theory of the origin of man unless science teachers specifically choose to discuss it on their own initiative.

The new textbooks, then, do not explore the evolution-creation controversy, but ignore it and adhere to the scientific method. They have not bowed to the fundamentalist pressure for inclusion of creationism but retain evolution as one of the unifying theories of the field of biology. No attempt is made to present evolution as a fact, a mistake that has been made before, but no fear of exploring the topic is seen either. The theory of evolution will be safe in the Indiana biology classrooms as long as these texts are followed.

Table III. An analysis of evolution and creation content in the five Indiana state adopted textbooks, for use during the years 1976-1981.

	Textbooks identified by first author & reference number				
	Moore (1)	Oram (2)	Otto (3)	Weinberg (4)	Welch (5)
Total number of pages in text	595	706	853	644	764
Number of pages devoted to evolution	63	61	31	93	73
% of pages devoted to evolution	10.6	8.6	3.6	14.4	9.6
Topic					
Explanation of evolution as a theory	X	X		X	X
Definition of evolution		X	X	X	X
Historical prospective of views on the origin of man before the 19th century	X			X	X
Evolution as a conflict with religious dogma	X			X	
Lamark's theories of inheritance	X	X	X	X	X
Darwin's theory of natural selection	X	X	X	X	X
Origin of Species as Darwin's definitive publication	X	X	X	X	X
Alfred Wallace's contribution to theory of evolution		X		X	X

X = concept discussed in text

X^t = concept mentioned only in Teacher's Edition of text

X^N = discussed in text but not in chapters on evolution

Table III. continued

Malthus' contribution to Darwin's formulation of natural selection		X		X	X
DeVries' mutation theory of evolution	X		X	X[N]	
Role of mutation in evolutionary change	X	X	X	X[N]	X[N]
Artificial selection as an evolutionary directive					
Role of sexual vs. asexual reproduction in evolutionary change					X[N]
Evolution in reproductively isolated groups		X	X	X	X[N]
Mechanism of formation of fossils	X	X		X	X
Role of fossils in determining evolutionary lineages	X	X	X	X	X
Types of fossil dating methods	X	X	X	X	
Evolutionary comparison of homologous structures	X	X	X		
Evolutionary comparison of analogous structures			X		
Significance of vestigial structures in evolutionary process	X	X	X	X	
Evolutionary Geologic timetable	X	X	X	X	
Biochemical evidence for evolution	X	X		X	
Line of human evolution through primates	X	X	X	X	X
Adaptation of organs (eye, kidney, etc.)	X	X			
Oparin heterotroph hypothesis	X	X	X	X	X
Stanley Miller's organic soup experiment	X	X	X	X	X
Divergent and Convergent evolution		X	X	X	
Types of early human forms	X	X	X	X	X

Table IV. An analysis of evolution and creation content in the seven Indiana state adopted textbooks, for use during the years 1981-1986.

	Textbooks identified by first author & reference number						
	Creager (6)	Hickman (7)	Meyer (8)	Oram (9)	Otto (10)	Slesnick (11)	Smallwood (12)
Total number of pages in text	752	754	783	717	758	689	758
Number of pages devoted to evolution	53	85	91	60	25	47	19
% of pages devoted to evolution	7.0	11.3	11.6	8.4	3.3	6.8	2.5
Topic							
Explanation of evolution as a theory		X	X	X			X^t
Definition of evolution		X	X	X	X	X	X
Historical prospective of views on the origin of man before the 19th century	X						
Evolution as a conflict with religious dogma				X^t			
Lamark's theories of inheritance	X	X	X	X	X	X	
Darwin's theory of natural selection	X	X	X	X	X	X	X
Origin of Species as Darwin's definitive publication	X	X	X	X		X	X
Alfred Wallace's contribution to theory of evolution	X	X	X	X			X

X = concept discussed in text
X^N = discussed in text but not in chapters on evolution
X^t = concept mentioned only in Teacher's Edition of text

Table IV continued

Malthus' contribution to Darwin's formulation of natural selection		X	X	X			
DeVries' mutation theory of evolution					X		
Role of mutation in evolutionary change	X	X	X[N]	X	X	X	
Artificial selection as an evolutionary directive	X	X	X				X
Role of sexual vs. asexual reproduction in evolutionary change	X						
Evolution in reproductively isolated groups	X	X	X	X	X	X	
Mechanism of formation of fossils	X	X	X	X		X	
Role of fossils in determining evolutionary lineages	X	X	X	X	X	X	
Types of fossil dating methods	X	X	X	X	X[N]	X	
Evolutionary comparison of homologous structures	X	X		X	X	X	
Evolutionary comparison of analogous structures					X	X	
Significance of vestigial structures in evolutionary process		X		X	X	X	
Evolutionary Geologic timetable	X			X	X	X	
Line of human evolution through primates	X	X	X	X	X		X
Adaptation of organs (eye, kidney, etc.)				X		X	
Biochemical evidence for evolution	X	X	X	X		X	
Oparin heterotroph hypothesis	X		X	X	X	X[N]	
Stanley Miller's organic soup experiment	X	X[N]	X	X	X	X[N]	
Divergent and Convergent evolution	X	X		X	X	X	
Types of early human forms	X	X	X	X	X		X

Conclusion

The dangerous conclusion that can be reached from the textbook examination in this study is one of a victory for the evolutionists and the death of the creationist theory. This is certainly not the case. As a religious concept, creationism has the advantage of being more than just a concept explaining the origin of man--to many it is the thread that holds their spiritual hopes together. What good is reason to them when their dream of a Creator seems to be threatened? Blind emotion will conquer logic if logic is not very, very, careful.

Creationism is not a science, and as such does not belong in the biology curriculum. There can not be any "equal time" for creation in the classroom, because it does not warrent this consideration. It is an erosion of the method of science, and a rejection of the power of reason. Only when creationists are willing to submit their Creator to scientific scrutiny will they be able to rationally examine the method of the origin of life on earth, and this, they can never do.

It is easily forgotten that amid the uproar of the ideological controversy lie children waiting to understand. If it is the objective of schools to help children become better informed and scientifically literate, then we cannot allow them to become the victims of our dogmatic emotion. Students have been the battleground on which the war has been fought, and many times have found themselves caught between their parents and their teachers, their church and their science. By teaching science in the science classroom and religion in the churches, we can, as George Bernard Shaw said, "see the child in pursuit of knowledge, and not knowledge in pursuit of the child."

Notes

1. Gail Kennedy, Evolution and Religion, (Boston: D.C. Health and Co., 1957), p. 56.

2. Ray Ginger, Six Days or Forever?, (Boston: Beacon Press, 1958), p. 111.

3. Kennedy, p. 65.

4. Ginger, p. 149.

5. Kennedy, p. 6.

6. Sydney E. Ahlstrom, A Religious History of the American People, (London: Yale University Press, 1972), p. 769.

7. Roger A Johnson & Earnest Wallwork, Critical Issues in Modern Religion (Engelwood Cliffs, New Jersey: Prentice-Hall Inc., 1973), p. 94.

8. Ahlstrom, pp. 769-770.

9. Lyon deCamp, The Great Monkey Trial, (New York: Doubleday & Co., 1968), p. 35.

10. Ibid., p. 48.

11. Ginger, p. 3.

12. deCamp, p. 390.

13. Judith V. Grabiner & Peter D. Miller, "Effects of the Scopes Trial." Science 185 (September 6, 1974), p. 832.

14. Gerald Skoog, "Topic of Evolution in Secondary School Biology Textbooks: 1900-1977." Science Education 63 (October 1979), p. 628.

15. Ibid., p. 630.

16. Ibid.

17. Gerald Skoog, "The Textbook Battle over Creationism." The Christian Century (October 15, 1980), p. 974.

18. Gerald Skoog, "Does Creationism Belong in the Biology Curriculum?" The American Biology Teacher 40 (January 1978), p. 25.

19. Wayne A. Moyer, "The Problem Won't go Away." The American Biology Teacher 42 (April 1980), p. 234.

20. Robin M. Henig, "Evolution called a 'Religion,' Creationism Defended as a 'Science.'" BioScience 29 (September 1979), p. 513.

21. Skoog, "Does Creationism Belong in the Biology Curriculum?" p. 25.

22. Grabiner & Miller, p. 836.

Literature Cited

Ahlstrom, Sydney E. A Religious History of the American People. London: Yale University Press, 1972.

deCamp, Lyon The Great Monkey Trial. New York: Doubleday & Co., 1968.

Ginger, Ray. Six Days or Forever? Boston: Beacon Press, 1958.

Grabiner, Judity V., and Miller, Peter D. "Effects of the Scopes Trial." Science, 6 September 1974, pp. 832-837.

Henig, Robin M. "Evolution called a 'Religion,' Creationism Defended as a 'Science.'" BioScience 29 (September 1979): 513-516.

Johnson, Roger A., Wallwork, Earnest. Critical Issues in Modern Religion. Engelwood Cliffs, New Jersey: Prentice-Hall Inc., 1973.

Kennedy, Gail. Evolution and Religion. Boston: D.C. Heath and Co., 1957.

Moyer, Wayne A. "The Problem Won't go Away." The American Biology Teacher 42 (April 1980): 234.

Skoog, Gerald. "Does Creationism Belong in the Biology Curriculum?" The American Biology Teacher 40 (January 1978): 23-26.

Skoog, Gerald. "The Textbook Battle over Creationism." The Christian Century, 15 October 1980, pp. 974-976.

Skoog, Gerald. "Topic of Evolution in Secondary School Biology Textbooks: 1900-1977." Science Education 63 (October 1979): 621-640.

References

Barbour, Ian G. Myths, Models and Paradigms. New York: Harper and Row, Publishers, 1974.

Cravens, Hamilton. "The Impact of Evolutionary Thought on American Culture in the 20th Century." Intellect 106 (August 1977): 83-86.

"Easy out Offered for Evolution Trial," The Times-Picayune, 4 March 1981, p. 3.

"Fundamentalist Religions Grow, Spread Doctrine with new Vigor," Dayton Daily News, 4 May 1980, p. 4B.

Hooykaas, R. Religion and the Rise of Modern Science. Grand Rapids, Michigan: William B. Eerdmans Publishing Co., 1972.

Hovenkamp, Herbert Science and Religion in America 1800-1860. University of Pennsylvania Press, 1978.

Mayr, Ernst. "Evolution." Scientific American 239 (September 1978): 47-55.

Parker, Barbara. "Creation vs. Evolution: Teaching the origin of man." The American School Board Journal (March 1980): 25-33.

Paul, Harry W. The Edge of Contingency. Gainesville, Florida: University of Florida Press, 1979.

Shidler, Emerson W. Believing and Knowing. Ames, Iowa: Iowa State University Press, 1966.

Turner, Frank M. Between Science and Religion. London: Yale University Press, 1974.